THE SCIENCE NEWS-LETTER

A Weekly Summary of Current Science

EDITED BY WATSON DAVIS

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PLANTS GROW QUICKLY AFTER ETHER SPREES

No longer will useful plants be allowed to sleep out their long winter sleep if a discovery announced to Science Service by Prof. David Lumsden of the Federal Horticultural Board becomes the common property of nurserymen, amateur and professional gardeners and even farmers. For he has found that if given a "shot of dope", either by the inhalation or hypodermic method they may be awakened as if by an alarm clock and set to their work of growing and producing flowers or fruit for the pleasure or profit of man.

The drug used in his experiments was the common ether of the hospital operating room, but instead of putting his plant subjects to sleep it woke them up. They liked it and seemed to thrive after just one treatment. For example, some plants were taken from outdoors in midwinter when they had to be dug from the frozen ground with picks, were given an overnight ether debauch and the next morning, shoots of an average length of one-eighth of an inch had sprouted. Kept indoors they continued to grow and flowers were produced weeks in advance of the usual blossoming season.

Roses were taken from the frozen ground and given a hypodermic injection of the same drug. Not only did they sprout and grow but, more important still to the indoor gardener, they were immune to all the ordinary plant diseases that make indoor rose culture a practical impossibility except in large greenhouses. Professor Lumsden has had roses in February, just six weeks from the time the plant was given its stimulating injection.

Only a very small quantity of ether is needed. In the inhalation method the plants are put in an airtight chamber containing 27 cubic feet of space. Five cubic centimeters of ether, or about a tablespoonful, are then introduced and the chamber sealed. Only about twelve hours exposure to the fumes is needed, and then the little plants are wide awake and growing.

In the hypodermic method, Professor Lumsden made use of that sometimes formidable weapon, a woman's hatpin. With this a puncture about a quarter of an inch deep was made at the base of the stem of the plant where it joins the root. Then an ordinary hypodermic needle was introduced and half of one cubic centimeter of ether injected. This is the method which was generally used with woody plants such as roses or lilacs.

One of the important applications of this whole process, according to Professor Lumsden, is that using either method of drugging the plant, every single latent bud or shoot is brought to life. That is not Nature's way, as usually only one of three or four ever grows. This may mean much in the cul-

ture of plants such as dahlias or potatoes which are grown from tubers. If every latent bud on these tubers could be made to grow they could be cut into smaller pieces, and expense of seed saved. What is more, Dr. Lumsden believes that the plants would be more vigorous.

For he is working now to see if these ether treatments, especially the hypodermic sort, do not impart a lasting vigor to the plant, enabling it to resist disease. His experiments with roses strongly indicate this. If they are confirmed, ether "shots" will with plants take the place of the various forms of vaccinations to which the would-be healthy human is now subjected.

Finally, there is a mystery in this whole affair which science may some day solve, but of which it now knows little. Ether temporarily stimulates and then profoundly depresses all animal life. With plant life in moderate doses it is apparently all stimulation with no depression and no injurious after effects, but instead a lifelong increase in strength and endurance. If science can learn why this is so, much light will be thrown, Professor Lumsden says, upon the secrets of physiological growth.

READING REFERENCE - Ganong, W.F. The Living Plant; a Description and Interpretation of its Functions and Structure. New York, Henry Holt and Co., 1913.

DYSENTERY CURED BY GERM-EATING FERMENT

The curative powers of bacteriophage, the mysterious products of Nature's laboratory, which dissolves and destroys the bacteria of deadly diseases, are described by Dr. Ralph C. Spence and Dr. Earl B. McKinley of the Baylor University College of Medicine in a recent report to the Southern Medical Association. They tell how by use of bacteriophage they cured 18 of 20 children suffering from a severe form of dysentery while among other children, not so treated, the mortality was 40 per cent.

Bacteriophage was discovered by Dr. F. d'Herelle of the Pasteur Institute of Paris in 1917, and was first thought to be an ultra-microscopic form of bacteria which preyed upon the bacteria causing disease. More recent investigations indicate that it is a chemical substance resembling a ferment. It is produced in the intestines of persons suffering from infectious disease, and may be isolated in a pure state. Cultures are made of the infected material from the patient. These produce more disease germs, and bacteriophage. The disease germs may all be filtered out of the solution, leaving a pure culture of bacteriophage.

If a minute quantity of this mysterious solution then be added to a test-tube full of a culture of deadly germs, the germs are all dissolved, "eaten" by the bacteriophage, whose name, derived from the Greek, means literally, "bacteria-eater". Not only does the bacteriophage "carry on" in a test-tube but if administered to a sufferer from the disease it will apparently eat up the germs which are killing him and cause quick recovery.

This is what happened in the cases reported by the doctors. The twenty children, varying in age from four months to six and a half years, had been

ill on the average for a little longer than three days with the deadly "bacillary dysentery". Their average maximum fever had been a little more than 103 degrees. From the beginning of treatment to complete recovery was less than six days on the average, and there were no recurrences. In cases not treated by the bacteriophage and which recovered, the average time required for recovery was 19 days.

Two of the twenty children died after bacteriophage treatment. Of these one was a "cretin", an idiot dwarf as the result of an insufficient thyroid gland; the other was apparently on the way to recovery when it ate green apples and died in convulsions. Of twelve children not given bacteriophage treatment, but cared for otherwise according to the bact practice, five died.

In addition to these cases, Dr. McKinley has reported the cure of suppurating wounds by local applications of bacteriophage, and other doctors in different parts of the world have recently reported cures of typhoid fever, blood poisoning, and other infections by similar treatment. Drs. Spence and McKinley conclude as a result of all these observations that:

"The bacteriophage holds enormous possibilities as a new weapon for fighting infectious diseases."

READING REFERENCE - Kendall, Arthur Isaac. Civilization and the Microbe. Boston and New York, Houghton Mifflin Company, 1923.

Lankester, Sir E. Ray. Bacteria, Chapter XXVII of the Outline of Science, New York. G.P. Putnam's Sons, 1922.

GERMS PROTECT NURSES FROM DISEASE ATTACKS

Among forty-one nurses carrying the germs of acute tonsilitis in their throats in the summer, only one developed the disease during the following fall and winter, whereas of sixty-three nurses who did not carry the germs, twenty-six developed a typical attack of tonsilitis, experiments conducted by Doctors Arthur L. Bloomfield and A.R. Felty of the Johns Hopkins Hospital show.

According to the doctors, their investigation indicates that the germs carried by the nurses in the summer acted as a sort of chronic vaccination. When the germs disappear from the throat and tonsils resistance against a new attack is retained for a while but finally lost. It was also discovered that these particular germs preferred to grow on tonsillar tissue and they did not thrive on the mucus membrane of the throat.

This study throws light, it is claimed, on the open question whether it is best to protect non-immunes by quarantine or to gradually harden and acclimate them.

MANY DWARFS AND FEW GIANTS IN THE HEAVENS

By Isabel M. Lewis,
of U.S. Naval Observatory.

Old Sol need not feel so badly after all. It may seem hard to be called "small" and "insignificant" and "a yellow dwarf" all the time and compared disparagingly with such puffed up fellows as Betelgeuse and Antares or such burly giants as Rigel and Deneb, in Cygnus, but they have been taking some statistics of the heavens at the Harvard College Observatory lately and the little fellows are getting their innings. Dwarf stars overwhelmingly outnumber the giants in the heavens. For every blue-white helium star, diamond-like in its glittering splendor, there are five huge, ruby-like giants such as Betelgeuse and 1700 modest little yellow dwarfs like the sun.

Consider a huge cube in the heavens, three hundred and twenty-five light years, or about two thousand trillion miles, along each edge. Dr. Harlow Shapley shows as a result of his computations, based on actual star-counts, that there would be within such a cube four or five helium or Orion-type stars, such as Rigel, 250 hydrogen stars, somewhat less hot and massive than the helium stars, 22 red giants such as Betelgeuse and Antares, the coolest and youngest of all the stars, 160 orange-hued giants like Arcturus, a little hotter, older and denser than the red stars, and 7600 yellow dwarfs in the same class with the sun. Of stars such as Procyon, in Canis Minor, the Lesser Dog, yellowish-white in color, dwarfs slightly hotter and larger than the sun, there would be 680.

There is more in favor of the little dwarfs than mere numbers, too. Most of the stellar energy comes from stars of this type. Betelgeuse may have twenty or thirty million times the bulk of our sun but it is estimated that it has not more than fifty times the substance. Whatever their size may be, stars differ very little in the quantity of matter they contain, and matter, or mass, is one form of energy.

Among the stars, as in this little old world of ours, most of the work is done by the average or so-called mediocre class. Our little dwarf sun has been on the job every minute now for a thousand million years or more and with a rather large family to look out for most of the time. We must say he has made a success of it, too. He has supplied his family abundantly and unceasingly with the necessities of life during all that period with no outside assistance, and has piloted them skillfully past all celestial dangers of closely approaching rival suns, vast dark cosmic clouds or extinct bodies.

It is a question whether the red giant Betelgeuse, still in his youth, has done, or will do, better. It strikes us that the earth would feel rather crowded out into the cold if it should undertake a revolution around this huge fellow with his low surface temperature. Rigel, on the other hand, with its excessive heat and brilliancy might prove too dazzling an orb to encircle at close range. Perhaps, after all, the small dwarf stars are the most kindly parents to satellite worlds and we may have cause to congratulate ourselves that our sun is neither excessively large, like Betelgeuse, or excessively brilliant, like Rigel, but is just a plain, substantial little dwarf like most of the others in the stellar world.

FARM INSECT PEST INVADES N.Y. CITY

The European corn borer, an undesirable immigrant which has already caused serious damage in a few widely separated parts of the east, has invaded New York City. This typical farm pest has apparently felt the lure of the bright lights and has established himself in the Metropolis, along the waterfront sections of Brooklyn.

Fearing that he may naturally feel like returning to the farm in the springtime and that he might invade some of the rich truck farming section of the Long Island suburbs, the U.S. Department of Agriculture is on his trail, and the second battle of Long Island in which a foreign invader is the enemy is about to begin. He will literally be fought with fire.

This latest invasion is believed to have been due to broom-corn. Last year the crop was short, and much was imported from Europe where the corn borer is a serious pest. The imported corn was sterilized by steam, and no borers are believed to have gotten in through regular channels; but some bundles were broken in transit and were thrown overboard in the harbor, unsterilized. These are believed to have drifted ashore and started the infection.

The borer first arrived in this country a decade ago and has spread chiefly around Boston, in the upper Hudson valley, and along the shores of Lake Erie. In badly affected fields it may cause a loss of 15 per cent. of the crop. Other crops besides corn are affected.

While making his home in New York, the borer is dwelling in hollow-stemmed weeds which are quite favored by him. In these he passes the dormant larval stage during the winter, and upon this habit the warfare against him depends. The Department of Agriculture men will first mow and then burn all the weeds in the infected area, which is largely vacant lots.

The importance of the fight may be recognized even by those who think a farm pest in a great city nothing to worry about, when it is known that a few miles [illegible] eastward out on Long Island one million bushels of sweet corn are raised every year.

READING REFERENCE - Caldwell, Otis W., and Slosson, Edwin E. Science Remaking the World. Article by L.O. Howard on 'Our Fight Against Insects. New York, Doubleday, Page and Company, 1923.

GELATIN HELPS DIGEST MILK

Gelatin, regarded by many as useful only for the making of insubstantial deserts, is given a high place in the human dietary by Dr. Thomas B. Downey of the Mellon Institute of Industrial Research. As the result of a long series of experimental feedings of gelatin to animals and human beings, it has been shown to aid in the digestion of milk and to be of great value in infant feeding.

Dr. Downey explains this action of gelatin by stating that it acts as a protective coating over the globules of fat and of casein in the milk, causing them to remain finely divided and so preventing the formation of tough, indi-

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gestible curds. The first animals experimented with were rats. A litter after weaning was divided and half placed upon a milk and egg diet without gelatin and the others given the same food with gelatin added. Those given one per cent of gelatin with milk grew normally and were healthy after six months and yet ate less food. Those not given gelatin were losing health and vigor after six months and were not able to produce healthy young.

Gelatin was then added to the milk given to babies in a large hospital [illegible] who had been losing weight and vitality for from 10 days to two weeks after birth. One per cent added to the milk, enabled them to digest it and they returned to normal health and growth, Dr. Downey reports. He also states that gelatin supplies protein deficiencies which exist in bread and in cereal foods.

RASMUSSEN BECOMES FRIENDLY WITH AN ESKIMO OUTLAW

By Knud Rasmussen,
Leader, Danish Arctic Expedition,
Now in Far North.

Written at Arviligjuaq, Pelly Bay, near Magnetic North Pole.

(After visiting an Eskimo family, Rasmussen and his party go in search of "The Frostbitten", an Eskimo murderer. They have pursued him and have just come in sight of Frostbitten and his adopted son who are armed.)

(Continued from last week's News-Letter)

The dogs, finding a track for the second time that day, were evidently bent on not being disappointed in this case and stretched away at full speed. In the course of a few moments we were there. I jumped off the sledge and advanced laughingly towards the two men who saw that we were strangers. They were apparently impressed with the informal manner in which we made our entrance on the stage that might have been a scene of combat had we not understood the proper way of dealing with the outlaw.

Instinctively I addressed The Frostbitten in the words with which his father greeted me. I said:

"We are only ordinary folk, that do not think of evil."

The Frostbitten replied, "Also here we are only quite ordinary folk."

Then I told him that I had met his father and his brothers and informed him that they had directed me to his hiding place. The tense strain which The Frostbitten had been subjected to resolved itself into quite extraordinary joy, when he knew who I was and what we wanted. He invited us inside his house, placing blubber and dried reindeer meat before us as much as we could eat. But it took some time before he was quite himself. He was short-winded from excitement.

I begged him and his foster-son to come up to our camp, and half an hour later we were on our way to our comrades at the salmon depot.

The Frostbitten and I became great friends. He trusted me to such a degree that he told me the whole story of his life, an extremely interesting contribution toward the so-called wild man's psychology.

Time flies, and I can write but briefly here. When home again I shall write a book. There is material a-plenty for exciting tales of outlaws, as well as stories on customs and folk-lore.

Crimes are of common occurrence in these regions. A short time ago a white man was killed near Ponds Bay, and a police patrol is now searching for the murderer. In 1905, a Canadian traveller, Caldwell, disappeared together with two Eskimoes; nobody knows his fate. In 1910 two American explorers, Radford and Street, were killed by Eskimos in Bathurst Inlet, and in 1913 two Roman Catholic priests, Rouviere and Le Roux, were murdered at Coronation Gulf.

Inspector French, who searched for the murderers of Radford and Street, writes in his report that he does not consider these regions to be safe for lonely white men. However, this hardly applies to those speaking the Eskimo language, and therefore we need not fear.

This country is called Arviligjuak, meaning the land of whales, and it is a popular belief that it is so named after some large stones in the hinterland which at a distance look like a whale awash.

The people of the Arviligjuarmiut tribe seem to be rather spirited; more primitive Eskimos do not exist, for since Ross' wintering at the Boothia isthmus in 1829 - 32, they have had no intercourse with white men. And the white man's fifth commandment, "Thou shalt not kill", does not quite seem to have gained ground up here. This commandment is apparently quite as difficult for the Eskimos to keep as for white men.

Besides "The Frostbitten", whose real name is Igssivalitaq, there are others who also have sinned against the fifth commandment. Here at our wintering place we have Uvdloriarssugssuk, "The great Star", who in the autumn killed his brother Arnartaoq for trying to stab his wife with a knife. Arnartaoq had become a danger to his surroundings, so that the killing was rather an execution than a murder, this being evident by the fact that he was doomed because the tribe unanimously desired his death. Therefore he was allowed to choose how he preferred to die; be shot, knifed, or hung. He chose a bullet.

Then there was Tikeg, "The Indexfinger", whom we met among the Netjiliks; he killed Pujataq of Iluileq to gain a wife.

Then also there is said to be a small tribe at Bebbot Strait consisting of five men of which two - Inugdlugarjuk and Uviloq - fled northwards after both had committed murder to procure women; for it must be remembered that here women are often scarce, where girls, according to custom, are killed at birth if not immediately bethrothed. Boys, on the other hand, are always inviolate.

They are, however, intelligent people, at heart far from barbaric or cruel, this being shown by their kindness to the elders of the tribe.

It was "The Frostbitten", the murderer, who introduced us to his kinsmen, the Arviligjuarmiut. And as he was a man of good repute, strong and powerful in all sorts of manly exercises, as they always say in the folk-tales, he was just our man.

At the present moment we are encamped in snow-huts at the mouth of Pelly Bay on the sea-ice. The camp includes about half a hundred people. All our stuff is outside the snow-hut in unlocked boxes, but not a single thing has been stolen from us during our stay here.

Tomorrow our work here is finished, and Helge Bangsted is returning to the headquarters of the expedition on the island in Fox Channel, whereas I go in search of the Netjiliks who for the time being are said to be on the sea-ice in the vicinity of the Magnetic North Pole. Ten days we have spent with the Arviligjuarmiut, resulting in an extraordinarily fine ethnographical collection. The tribe is undoubtedly the most primitive of living Eskimo tribes, only a few possessing a gun, the rest still using bow and arrows. Their chief foods consist of the abundant salmon, also seal, reindeer and musk-ox.

The Canadian order for the protection of the musk-ox has apparently not yet reached this place, for the Mounted Police has not yet made an appearance. Thus from a hunter called Qingmitiaq (The Dog) we have procured for our zoological collection a musk-ox skin including skull; it is of an enormous bull. I trust the police will permit us to keep it. Our collection of implements is most interesting, consisting of bows, arrows, lamps, household utensils, and primitive knives.

Of especial interest has been the obtaining of information regarding the visits of earlier expeditions in these regions, for instance, the wintering of Ross at Victory Harbor in 1830-32 in the vicinity of Boothia Isthmus. As is known Ross was shipwrecked here, and to this very day the iron and copper from the wreck of "The Victory" is used in the manufacture of spear points, harpoons and smaller knives, with some of which we have enriched our collections.

Wood is extremely scarce here, and a couple of sledges of musk-ox skin have been purchased. Sledges made of frozen tent skins are used.

The reminiscences of the Eskimos regarding Ross and his travels are splendid examples of their reliability in respect to historical events, though these date so far back.

The name of the man who in the winter 1830 was the first to discover Ross, was Avdlilugtoq. He believed that the ship was a mighty spirit. Especially the tall masts filled him with terror. He fled home, but the next day all the men of the tribe marched out armed with harpoons and arrows to attack the great spirit who, however, gave them an extremely hospitable reception. It was their first meeting with white men.

Their memory with regard to these events is so detailed that I have been able to put down the names of the various Eskimos who accompanied Ross on his

sledge journeys.

The oldest man of the tribe here, Iggiararssuk, has told me of the fate of the Franklin Expedition. His father, Mangaq, met, together with two other men, whose names also are known, the three last survivors in an extremely exhausted condition on King William's Land, helping them with seal meat and blubber.

Rae's first visit to Pelly Bay in 1847 and again in 1854, his journey across Franklin Isthmus to Sheppard Bay, Hall's journey in 1869 and Schwatka's in 1879 to King William's Land are all fresh in their memories.

COMMERCIAL AIRPLANES WAIT FOR LOWER COSTS

The future of airplane transportation as an economic possibility depends chiefly upon an increase in traffic, resulting in lowered operating costs, says an exhaustive report to the American Society of Mechanical Engineers by Archibald and D. R. Black, airplane engineers. At the present time, they state, the field of the airplane is the carrying of mail and small packages. Passenger transportation will not be profitable until there are enough planes in continuous operation to bring operating costs down.

This number is set at 50 planes each way a day between two points as far apart as New York and Chicago. All estimates are made for night flying because this is necessary to compete with railroad service. The type of plane assumed was the ordinary biplane or monoplane with a 600 h.p. engine, and capable of carrying a load of about one ton at a maximum speed of 125 to 135 miles an hour.

The figures presented show a rapid drop in operating costs as the number of planes in service is increased, since the initial capital expenditure is high, being estimated at $1690 a mile for the operation of one plane each way a day five days a week.

Increasing this headway to 50 planes each way daily would make possible, the engineers declare, the inauguration of a package service between New York and Chicago at a rate only slightly above the present express rates. Night letters might be carried distances up to 1200 miles and delivered quicker than by telegraph, this service being possible at the present time, they state. In fact, they assert that a package rate between New York and Chicago of $1.50 a pound would be possible with only a slight development of the business.

Commercial passenger traffic will have to wait until operations may be carried on with short headway, the report continues, giving the figure of 8.23 cents for the cost per passenger mile of fully loaded planes operating at the rate of 50 a day between New York and Chicago. This, the authors state, would be within competing distance of the extra-fare limited trains and the prediction is made that within 20 years at the utmost it will pay the railroads to undertake this service themselves in order to avoid competition from the air. Regular package service between New York and Chicago is predicted within the next two to five years.

TABLOID BOOK REVIEW.

BIRDS IN LEGEND FABLE AND FOLKLORE. By Ernest Ingersoll. New York: Longmans, Green and Company.

Legends and superstitions throw a definite light upon the obscure origin of common sayings and literary allusions to various birds, and Mr. Ingersoll shows that many of the legends are absurdly fantastic. For instance: "Ravens figure in many monkish legends, usually in a beneficent attitude, in remembrance of their friendly offices towards Elijah. One hermit subsisted many years on a daily ration of half a loaf of bread brought him by a raven, and one time, when another saint visited him, the bird provided a whole loaf! Fish were frequently brought: and once when a certain ermite was ill, the bird furnished the fish already cooked, and fed it to the patient bit by bit."

CALL OF WILD LURES TURKEYS WESTWARDS

The turkey, which in the opinion of old Ben Franklin should have displaced the American eagle as the national bird, is showing a typical American trait and is going west to the "wide, open spaces" to grow up with the country. Reports of the U.S. Department of Agriculture indicate that while the turkey population of the country as a whole has greatly declined during the past 20 years there has been a distinct increase in some of the western states.

With many more Christmas tables yearning for them there are hardly more than half as many turkeys in the country as there were two decades ago. U.S. Census reports in 1920 gave the turkey population as 3,627,028 as against 6,594,695 in 1900, and unofficial reports indicate a further decline since 1920.

This decline has been due directly or indirectly to one leading cause, the incurable wildness and roving temperament of even the tame turkey. The ancestral "call of the wild" leads him to roam all over the countryside, inviting all sorts of accidents; and if confined he gets sickly and may die.

But domestication has effected one important change in turkeys. It has made them bigger, so that if there are fewer birds than there used to be there is more to each one. The original wild turkey ancestors of the modern breeds were lightweights as compared with the huge birds that now come to market. The average weight of the wild male turkey is about 12 pounds, and that of the female is some four pounds lighter, while the average weight of their domesticated descendants when full-grown varies from 30 to 36 pounds for the male and from 18 to 20 pounds for the female.

The greatest increase in the gobbler population in recent years has been in the Dakotas and Montana, where their numbers have doubled, the reason being the abundance of range and the favorable climate. In these sections a novel way of protecting the wandering birds from fatal assaults of wild animals has been found. A small bell is tied around the neck of the older birds and its continual tinkling scares away the coyotes.
